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INDIANAPOLIS, WEDNESDAY, JULY 15, 1846.

COMMUNICATIONS.

REVIEW OF VOLUME ONE---No. 8.

Hollyhocks, p. In the fall of 1842, as I find among my memorandums, a hollyhock was raised in this place, measuring thirteen feet and five inches in height!

Blasted Roses, p. 263.—The questions here asked, have, I think, not been answered. They were overlooked in the regular course of these reviews; but they do not appear to be answerable at any time. Although the enquiries are made in particular reference to a "rose of the Noisette family," they have an important bearing upon some of the great crops of the farmer. If we can only find the key in this case, we may use it to the unlocking of many systems; and perhaps to the shutting out of some evils.

The most satisfactory explanation of the phenomenon in question, that I can arrive at is this:

1. The roots and the branches of a plant have that degree of independence of each other, that enables the one to live without the other, for a certain period. Thus many roots will remain in full vigor until they supply themselves with branches; and many branches will sustain themselves until they furnish themselves with roots.

2. The material by which all this is effected appears to be *within* the respective parts of the plants.

3. The supply of this material in the branches may be such, at the time of their separation from the root, that leaves will be expanded; and flowers fully developed. But why is fruit not perfected?

The proper answer to *this* question, is the best I can give at present to the editorial enquiries. The branches are not wholly independent of the root; so that when the leaf-buds and the flower-buds have consumed all the stock on hand, provided for their growth, they begin to perish. Now, if the roots and branches while attached to each other, are disproportioned in their powers, by any adventitious agency, a similar effect will be produced. Take, for example, the very appropriate case of our apple trees this season. The wonderful profusion of blossoms on all trees, promised to many an abundant crop of fruit; but scarcely had the fruit "set" before it began to fall; so that now the ground beneath the trees is thickly strown with young apples from the size of a pea to that of a walnut. This shedding of apples is not the effect of an insect: by carefully cutting open transversely the apples indiscriminately under several trees, (a hundred apples from each,) I found *ninety-eight hundredths* perfectly sound. I ascribe this loss of fruit, then, to the same cause that produced the blasting in the roses. Let us suppose, then, that by a late and vigorous action of the roots of the apple trees last year, or by any other cause, as by the late and vigorous action of the branches unduly pressing the energies of the root, the branches became supplied with material to set a superabundance of buds: what will be the anticipated effect, according to the views exhibi-

ted. The leaf and flower-buds will be developed, and expend all the material at hand; and, if the roots are still sleeping, or not in corresponding action, from whatever cause, the fruit cannot go on to perfection, for want of continued or sufficient sustenance.

It is in this way, too, that I have accounted for a second crop of flowers in some plants and trees, followed by matured fruit, after the failure or blasting of the first and regular set of flowers. All the buds not having expanded, the root and the *dormant* buds begin to act simultaneously and normally; so that one sustains the other throughout.

If this view of the question is a correct one, the remedies will readily suggest themselves.. The root must be stimulated into seasonable and commensurate action; or the number of branches must be reduced to a level with the powers of the root, or which is the same thing, with the supply of nourishment; or the number of blossom-buds must be reduced by plucking them off early. The reader may take the following fact in this connexion, for what it is worth. All my apple trees, this spring, exhibited a "boundless blush" of flowers: it seemed almost impossible for more blossoms to be crowded together: *one tree* last fall, had several large limbs cut from it to make way for a building: while the other trees have shed, perhaps, most of their apples, and the trees remain comparatively barren, this maimed tree is *loaded with dense clusters of fruit*, as if every flower had perfected its germ.

And here I will close the reviews, and dismiss the reader who has been kind enough to listen to these chattings. I should long ago have suspected that I was becoming tiresome and unwelcome, if the occasional approbation of the editor, had not encouraged me to proceed. The review has given me a sufficient variety of subjects to diversify these numbers; and the stock is not exhausted. Many excellent articles, and especially some of the editorial lessons have been passed over without a comment: I hope every reader has sufficient intelligence to discriminate them and be profitted by them; for to have commented upon every article according to its merits, would have extended those numbers beyond my wish, and, perhaps, the reader's patience. J. T. P.

GRASSHOPPERS.

Early in the season, my attention was arrested by the unusual number of grasshoppers, or rather their pupes; but I suspected no great mischief from them until a little before hay-harvest, I was told they had nearly eaten up a five-aker field of red clover designed for hay; every leaf and every head in the greater part of the lot, were consumed. I found the insect in other herbage beside clover; and very abundant in some wheat-fields, but apparently to no disadvantage. And neighboring clover-fields suffered variously; some not at all. I caught some of the depredators, and find them to be the *Acrydium flavo-cittatum*, or yellow-striped locust of Harris: it is our most common grasshopper.

Westwood in his "Modern Classification of Insects" cites a magazine as saying that in 1742 great damage was done to pastures, particularly about Bristol, [Eng.,] by swarms of grasshoppers. Harris says the red-legged locust, some seasons, almost entirely consumes the grass of the salt-marsh meadows of New England, and afterward devours "grass, corn, and vegetables" till disabled by frost or death.

Have our farmers no interesting observations to communicate, respecting the depredations of insects in their property? J. T. P.

PEA-WEEVIL.

For years, I have been endeavoring to correct the very general error, that the pea-weevil deposits her eggs *in the pea;* and I now again find occasion to re-iterate the correction. In Harris' valuable treatise on insects, I find this language: "They *pierce the tender pods*, and commonly lay only one egg *in each seed*." The egg is invariably deposited *on* the *pod*, to which it is fastened by a delicate film. The number of eggs varies from five to fifty on each pod, laid altogether at random; (Harris says, "one opposite each pea," but it is incorrect.) These hatch and the *grub* penetrates the pod, into the pea; and there may be from one to six or more in a pea; but all perish, except one, during their growth.

My practice of securing my peas from this insect, after the larva has entered them, has at last resulted in what, I suppose, is something entirely new in these United States—*peas perfectly free from insect depredation.* Not a puncture of any kind can be seen on them. And although I sought diligently at various times of the day, until the peas were nearly fit for the table, not a pea-bug, nor its eggs could I see. These peas, of course, need not be treated as recommended, as there are no grubs in them to destroy. My neighbors planted later, or *their* bugs would have infested my vines. J. T. P.

We should be glad to think that Dr. P. had obtained a bug-proof pea; but suspect the exemption to be attributable to the season. We have sown four times, beginning very early in the spring, but this far we have not, so far as we can learn, had a pea-bug near our vines; and, generally, we have found, that this weevil has not been much felt this season. *Ed.*

LETTERS OF A COSMOPOLITE---NO. 11.

HARTFORD, CONNECTICUT, June 21, 1846.

This part of the world just begins now, for the first time, to feel like the warm weather of the west, and the wheat fields, which by this time must be nearly ready for the harvest with you, are here just enjoying "fine growing weather," looking many a week hence for maturity. Corn is from eight to ten inches high, and is undergoing its first hoeing, for in this part of the world they *hoe* corn. Potatoes are just in bloom, and oats look well up—quite wavy like, when the wind comes out a sparking.

Early in the morning and at sundown, a ride or a walk around Hartford, presents the richest and most agreeable landscape of the style, that I have ever seen. The valley of the Connecticut here spreads out into a large "basin" of dimensions unknown to me, but large enough to give to the picture, those *distances* that artists are fond of, and although hill and water may not be visible,

and the whole plain appear only rich and verdant, yet it is a varied richness; woods, fields, orchards, and pastures, set off by the scattered cottages, and the city, half concealed by trees, offer to the eye a very beautiful prospect, that wears well. No wonder that the beaus and bells of Hartford are given to rides and drives, when in addition to the attractions they mutually afford, the look of every thing around is so cheerful and happy.

The Charter Oak, is *the* lion of this city; and a real fat, cross-grained, gnarly lion it is, well worth visiting, if not to stir it up, at least to be stirred up by its venerable associations, and rendered thoughtful by contact with any thing so old and that might tell so much, were it only gifted with speech. Aside, however, from its associations, it is well worthy of a visit as being so very rugged and picturesque—such a perfect old oak. Indeed I think it a handsomer tree than the old elm on Boston Common, of which so much is said, and of which so much care is taken.

Near the tree is a house, the *frame* of which was the first two-story frame in the colony, and was brought out from England by the ancestors of its present owners.

Antiquarian curiosity is on the growth in the eastern States, among which New York and Connecticut, with their historical societies, perhaps take the lead. In the Athenæum of this city (which is one of the most chastely elegant public edifices I have yet seen) is the library and museum of the Connecticut Historical Society, where can be found manuscripts, personal and public relics, individual naratives, old publications and records, and, in short, every thing that can be collected in the way of substantials and traditions, in a State where a nutmeg grater descends from generation to generation, and where everybody knows everybody else, and their pedigree up to nobody knows where. Of the interest and variety therefore to be found in this room of the society, you may therefore form some little conception.

But besides that part of the collection which belongs to New England history, the library is rich and select in other branches. English history has a very complete alcove to itself, comprising very rare works that warrant much more of interest than I have ever seen, either in compendous histories, or even in the historical fictions of Scott or Shakspeare who, if the truth were known, are the source of most of the popular historical knowledge of the day.

Here I feel tempted to a diversion—to say a word upon the matter of history—its use, and application; as the panoply of a statesman, nothing need be said of it; but in its common appropriation to the mass, there may be something said possibly valuable and useful.

When a student goes through a course of historical reading, he generally reads by the page, and forgets by the volume. A history and memorising of dates is most dry and unprofitable. But a history of individuals—a newspaper account of incidents, if compiled in good style—is as interesting as any novel can be; and though not a date may remain fixed, yet the whole course of events will become relatively fixed as a narrative, and the mind can take almost endless pleasure in recalling scenes and actions, while the mere memory of their time and place and person would be most unsatisfactory. Need I ask, then, what style of history should be chosen for children and students? or is a word necessary to show the entire inutility of those little skeleton treatises which are made up of proper names and figures, and which are placed in the hands of school-boys to memorize and recite?

Some of the old wordy chronicles of Englisl history, with their giant expressions and shrewd inferences are, for the above reasons, most intensely interesting, beyond anything that any modern historian has yet written, telling as they do of olden time, after the fashion of olden time; so that one feels himself as hearing from an old story-teller, tales in which the narrator was an actor or eye witness. But enough of this episode; let us return to Hartford.

The peace news from Washington has just reached here, in time to meet the pacific news from England, that comes in the Caledonia. So it seems that war is avoidable, and that Englishmen and Americans are never again to cross swords. Our good-principled New Englanders rejoice with great triumph at this confirmation of what they have all along hoped and labored for. It would seem to be a settled question now, that war shall not again exist between any civilized nations, and although much windy war may rage, yet it will turn out as this has, and as our western rail-roads too often do—all wind and no rain.

The spicy articles of Elihu Burritt, and his continual picking and fun-making at the ship Ohio and the patriotic campaign in Mexico, and at war in general, are producing some considerable talk, add the mass of the community think much with him upon these points. The assiduity with which he sends out and gets his little tracts read, by gratuitous distribution through rail-road cars, steam-boats, hotels and ships, is worthy of great praise, and methinks that the benevolence which dictates such labor and expense, is rather greater than ordinary. But his reward is sure.

T. K. B.

SELECTIONS.

ON THE DISEASES OF PLANTS.

The *roots* of plants may be wounded by instruments used in working the ground; from the attacks of subterranean animals, such as moles, rabbits, mice, and a whole host of insects: the last of which injure roots chiefly in a larva state, by devouring the minute rootlets, and when in great numbers the fibres often suffer in a great degree, being either broken by those which undermine for shelter, or eaten by others, and thus the plants are in a great measure deprived of their wonted supply of nourishment. The fibrils of roots are often broken, among plants of the pine tribe, by being violently shaken by the wind &c., and although none of the roots appear above ground, or even when the soil is scarcely broken around them, they suddenly decay, being deprived of nourishment, by the loss of the tender fibres; after wounds of roots, many trees remain apparently stationary in growth for a time, engaged, however, in forming roots according to the loss sustained. The operation of cutting, or laying bare, roots of trees, to force them to become fruitful, is only an apparent exception to the foregoing remarks, for the production of fruit in such cases, must be consid-

ered as the first step towards decay, it depending not so much on a full supply of nourishment, as on a state of maturity necessary for the purpose. Treatment.—When the roots have been attacked by insects, endeavor to destroy them; the most approved solution is lime water and tobacco water, poured upon the ground over the affected parts; even unslacked lime has been dug in with advantage. To entrap the wire-worm (Elates segetis) Sir Joseph Banks recommends slices of potatoes to be buried where they abound, and frequently examining the baits and destroying such as have collected on them. When a plant happens to have its roots lacerated, these ought to be protected from extremes of heat and cold; the ground in the neighborhood should be kept moderately moist; if possible the plant itself shaded; and whatever else may be found conducive to its health, should be resorted to, to induce the formation of new roots.

Gangrene of Roots.—This occurs often in roots, and is of two kinds,—wet and dry gangrene. An example of the first kind occurs frequently from too much moisture, accompanied with cold weather and a bad soil, or in consequence of the succulent nature of the parts in which it occurs. It is frequently found in "house plants," when these have been officially indulged with two much water. Dry gangrene in roots is similar to that in the stems, and is noticed under that head.—

Lacerated and incised wounds of Leaves.—These occur from attacks of animals, chiefly of the insect tribes: from hail, and many of the lower animals are very destructive to leaves whilst feeding. Some birds seem to do so for amusement. The *Aphis centunculàris* cuts out portions of leaves and carries them away for its use. Plants frequently become stripped of their foliage in a short time by the ravages of the catterpillars, of butterflies and moths, although generally they are more sparing in their attacks. These with many others attack most plants fit for the food of man. Various methods have been had recourse to for the destruction of catterpillars; washing with tobacco-water and soap, lime-water, &c. boiling water has also been tried with success, for those insects which seek the ground, at particular seasons, unslacked lime laid on, and dug in is advantageous. There is what might be termed an approach to a natural cure for this infection, in the larvæ of an aphidivorous fly which is described and represented by Darwin which will also feed on caterpillars. Mr. Elliot's remarks on the subject "when the foliage is all off the trees and bushes, wash them over with the hand engine to clear them of decayed leaves: for this purpose any water will do; then stir up the surface of the earth all round their roots, and lay a little hot lime about them to destroy the eggs. Hail is a frequent cause of wounds in leaves; and to ward off these destructive showers,, "paragrelis" have been used on the continent. The most approved kind consists of a pole of wood from thirty to fifty feet long, fixed perpendicularly in the earth, having a brass wire sharpened at the point, running from two to three inches above the summit down into the ground. These should be planted at the distance of from one to two thousand feet from each other. By their influence on the electric state of the atmosphere, the hail is said to be melted down to snow or rain, the descent of which does comparatively little mischief. It is chiefly in southern climes that these are required. Plants receiving wounds in their leaves, must be protected from extremes of heat and cold, from too much moisture, and altogether treated more carefully than usual, according to the habits of the plants affected.—

Punctured Wounds of Leaves.—Leaves are punctured by various insects for two purposes, viz. for the purpose of procuring food, and for oviposition. The most remarkable insect of the first kind is the Aphis, which attack the under surface of the leaves, and young stems, sucking the sap of the plant by inserting their curious proboscides.—From these wounds, the leaves become variously distorted in shape, generally assuming a blistered appearance, in consequence of the irritation from the punctures at particular parts; and sometimes several of these diseased portions may be seen rising nearly half an inch on the surface of a leaf otherwise healthy, the concavity of these are found to contain numerous Aphides; such distortions are generally of a whitish or reddish color, which will be explained shortly. On the leaves of the maple tree, round purple tumors, with narrow necks, are often found projecting from their upper surface, having a small opening leading into them from the under surface, nearly closed, however, by a number of morbidly enlarged hairs. These, we believe, to be the effects of punctures by the Aphis. Small white tufts are often seen attached to the leaves and stems of the larch; these are produced by a brown Aphis, and when examined by the microscope, are seen to consist of a bundle of fine filaments, generally twisted around the animal, and attached to the extremities of many; oval-shaped eggs are also frequently seen. Various methods have been proposed and practiced for the destruction of the Aphis. The most effectual appears to be fumigation with tobacco smoke, followed up by washing with lime-water, and finishing by digging the ground around the plants. Leaves are frequently found traversed by white lines, twisting and running in all directions,—they are caused by the larvæ of certain insects, which eat their way thro' leaving their excrements behind them in their paths; and so neatly do they perform their works of destruction, that by far the finest disection we have ever seen, were the works of some of these animals. They burrow under the cuticle, and generally confine themselves to the upper surface of the leaf, sometimes to the lower, occasionally however both are attacked; such we have observed in the leaves of many plants, and believe it to be in consequence of the larvæ piercing the leaves. Some insects lay their eggs close to each other on the back of the leaves of certain plants. After a time these become hatched, and the larvæ, each for itself, pierces a small hole immediately above the attachment of the egg from which it came, and passing through the leaf, arrives at the upper surface, where it commences its mining covered only by the cuticle; these do not traverse the leaves like the others, but confine themselves to one part. The leaves of apple and pear trees are very subject to this affection. The treatment of such is not as for the Aphis, in consequence of the protection they receive from the cuticle. The most powerful remedy is boiling water.

Wounds of Leaves with Oviposition.—The most curious effects produced by the wounds of insects, are the various kinds of galls. These are tumors produced on various succulent surfaces, varying according to the insects which effect them, or the plants in which they occur. They are caused by insects of the order Hymenoptera and Genus Cynips, and occur in a variety of plants, but most frequently in the oak and willow.—It is very evident, that these various excressences must materially injure the health of the plants on which they occur, from the inordinate consumption of substance required for their nourishment; and this is found to be the case, for when they occur in great numbers, from the excess of nourishment drawn off, the branch, or even the whole plant suffers, the leaves become distorted and small, and the whole plant stunted in growth. They scarcely admit of a *cure* in many plants. The method we would recommend in the early stage, is the application of boiling water; afterwards, when of considerable size, nothing but their removal will be of service.—

Parasitical Plants on Leaves.—Leaves are liable to become attacked by various cryptogamia plants, from circumstances not well ascertained. The most familiar of these diseases is known by the name of "*Mildew*" (Sporotricum macrosporum;) certain circumstances seem particularly favorable to its appearance, as cold dry weather, and particular exposures; plants under the shade of others, or otherwise shaded, apparently suffering more than those fully exposed. From microscopical observation, this parasitical plant, constituting "*mildew*," seems to be composed of globular semi-transparent masses, apparently attached to a stalk, sometimes to hairs on the plant, or collected into heaps on the surface of leaves and stems.—Amongst the remedies proposed, perhaps the best is thinning around the affected part, or removing to more light and air. Delicate and rare plants must have their leaves washed with water. We have found lime-water of service on apple trees. In hardy plants slightly affected, romove all the diseased leaves or shoots, and attend to the other circumstances mentioned. An apple tree annually affected, was perfectly cured by a free washing of what is termed the "*cream of lime*," during the winter; from this case we are inclined to think, that the seeds of the parasite remain about the buds and stems, until a fit period arrive for their evolution.—The red, termed "*Rubijo or rust*" (Uredo salicis) occurs on the leaves and stems of many plants; there is also a black kind, termed "Smut" (Uredo segetum.) It is most destructive to wheat, oats, &c., which are also very often affected with the red kind. According to the experiments of Mr. Young on this subject, it appears, that the best and simplest method for the prevention of these parasitical diseases in corn, is to steep the seeds of affected plants in lime-water for twenty-four hours. When either the black or red parasite appears on other plants, treat them as far the mildew. The leaves of several plants belonging to the kitchen-garden, viz: horse-raddish, cabbage, &c. are sometimes attacked by a parasitical plant (Urèdo candida) in appearance not much unlike the "*mildew*" to the naked eye, this disease has been found from experience to be highly infectious. The gooseberry tree is liable to be affected in spring by a curious parasitical disease, (Œcidium Grossulariæ.) The only remedy for which, as well as the former one, is the removal of the affected leaves, and this can be done generally with safety, as these diseases seldom involve many on the same plant at the same time.

Discoloration of Leaves.—Upon certain laws which regulate the proportion of acid and alkaline matter, depend the color of the leaves of plants, and these we know to be as various as the shades in the rainbow,—a certain proportion of these matters appears to be allotted to each; any deviation from which, generally more or less, injures the health of the plant. The most usual morbid change of color in leaves is from green to white, either of the whole or only part of a leaf. Mr. Knight has observed, that plants with white leaves cannot survive long, and that variegated ones bear the deprivation of the light ill: but he believes there are many such which are neither in a state of disease nor debility. This indeed seems to be the case with some, but there are very few which will not be found to suffer in various degrees from the variegation. Morbid discoloration happens from various causes, which counteract the natural influence of light on the leaves, and it may ultimately be in consequence of the obliteration of the pores, or "culs de sac," according to Mr. Todd Thompson, by which respiration is performed. In such cases, the blanched portions may obtain a quantity of carbonic acid, from that absorbed by the green portion of the leaf; but when all white, the acid, it is possible, may be obtained by the roots or stems. However, it is agreed, that it is from the accumulation of carbonic acid which takes place, such portions of the leaves being unable to decompose it, that the change of color happens, and which, indeed, seems to vary according to the excess of acid present. A want of proper nourishment, is a frequent cause of discoloration, also absence of light, and attacks of insects, as in the white and red tumors of the Aphis; again, from the destruction of roots or other vital parts; and indeed, anything which tends to injure the health of the plant generally, is apt to produce discolòration of the leaves.—

Gangrene of Leaves.—All the diseases described are apt to cause gangrene, either in the whole or a portion of the leaf.—

Wounds of the Stem.—The stem is very subject to wounds of various kinds, according to the nature of the instrument by which they are inflicted, and the particular texture involved.—Wounds which penetrate or remove a portion of the bark, as indeed all others, heal the quicker the more vigorous the branch or plant is in which they occur, and of course according to their dimensions; all wounds heal more rapidly from above downwards than in any other way; no doubt stimulated by returning juices. The most serious wounds of the bark, are those which detach it to a great extent all round the stem, for the consequence is, that all branches beyond the wound are forced to become fruitful, and thus premature decay is brought on. Simple incised wounds, and even those in which the bark is raised from the stem to a considerable extent, may unite if the edges be accurately adapted to each other, and the whole covered with some plaster to exclude the

air: Forsyth's preparation is perhaps one of the best. In *pruning*, numerous wounds are unavoidably inflicted; these, however, when smoothly and properly made, produce no mischief. Stems bruised or fractured more than half through, in many cases will recover; but when more than that it is generally better to remove them at once, especially in old plants. There are many plants which never recover even slight fractures, but gradually decay. On the other hand, many succulent stems will, by proper management recover, after being bruised and broken to a great extent. The most proper treatment for fractured or bruised stems, is to tie them up, bringing the edges of the wound neatly together so as to promote a union, and covering the whole with some plaster.

Wounds of Stems from Insects.—There is a minute insect, which frequently infests the stems of apple and pear trees; it is probably the Coccus arborum described by Reaumur. It attacks all the stems indiscriminately, which, in consequence, become covered with numerous muscle-like bodies, varying in length from one-eighth to three-sixteenths of an inch. The trees suffer from these when numerous by their inducing disease in the bark, from the lodgment of water, which they cause, and also by hindering the functions of the bark. The most effectual remedies for this affection that we have tried, are boiling water, as recommended by Mr. Beattie in the memoirs of the Hort. Soc. of Edinburgh, for 1827, and the "cream of lime" applied with care to the stems; or they may be scraped off, and the stems afterwards well washed with lime-water. Many insects attack the woody parts of plants, and trees in consequence become hollow, sometimes, again, the larvæ of some insects curiously undermine the bark of various trees, living upon the liber and alburnum, and forming twisted paths running in all directions.—

Ulceration of Stems or "Canker."—So various and opposite are the opinions advanced concerning the cause of this disease, that it is difficult, if not almost impossible, to discover the real one of eleven authors; the following table will show the various causes, and the number of supporters mentioned by each:—

Supporters.

8 Wounds of bark and wood.
8 Bad soil and subsoil, viz. wet,—stiff clayey—cold clayey—cold wet—wet gravel—exhausted soils—mossy bottom.
4 Injudicious pruning.
3 Bruises.
2 Gangrene of young shoots.
2 Attacks of insects.
2 Cold wet seasons.
2 Improper aspects.
1 Load of fruit,
1 Frost injuring sap.
1 Friction.

Removal of the affected part by the knife, and covering the wound with plaster, as recommended by Forsyth, is the most usual method by which a cure is attempted, and this, in some cases, seems to answer tolerably well, while in others it entirely fails.—

Gangrene of Stems.—The disease just described is frequently the cause of extensive gangrene, by which we mean, that the part loses entirely its vitality, and is in many cases, changed in its consistency, having its texture completely broken up, in all cases the color is changed, and generally to a reddish brown or black, but the texture is not always broke up Gangrene seems to occur, for the most part, in consequence of wounds, parasitical plants, great heat or cold, excess or want of moisture, lightning, &c. Extremes of heat and cold, and sudden alteration of temperature, are frequent causes of gangrene in succulent stems and other parts of plants, as the leaves, flowers, &c.; and the hopes of the gardener are often blasted by their influence, especially in the spring. The cherry, plum, and other stone-fruit trees, are subject to a species of gangrene which is generally called the "gum." The affected branches must be removed as soon as possible, for the disease is very rapid in its progress.—Stems sometimes become bark-bound, and this is supposed to arise from the cuticle not giving way as it ought to do; trees in consequence become stunted in growth. It is sometimes cured by longitudinal incisions along the stems down to the alburnum.

Natural Decay of Plants.—Like all other organized bodies, they are destined to exist but for a time; some for less than a day, others for more than a thousand years; but all are subject at last to decay, each having certain functions to perform, that the continuation of the species may be insured, natural decay never comes on till this process is completed; so that any means used to counteract natural decay, must be practiced with a constant reference to that fact.

R. Spittal, Esq.—*Cal. Hort. Trans.*

BLIGHT ON TREES.

An alarm has arisen among some of our correspondents as to the state of various kinds of plants in which they think that symptoms of universal disease are appearing; and they are apprehensive lest such general affections in the vegetable world should be forerunners of like plagues in the animal. The best way of dealing with those cases seems to be to take them separately.

A gentleman living near Sevenoaks sends specimens of a lilac whose young shoots are dying off irregularly. "I first noticed it," he says, "yesterday, and forty-eight hours seem to complete their destruction; the gangrene seems to begin just above the bud. My gardener had seen it the day before, and has called my attention to the common laurels, many of which in various aspects and situations are also affected; in these the disease manifests itself *first* in the *leaf*. The Portugal Laurel also is partially affected in the same manner, and I detect the same disease in the shoots of the yew. Neither wind nor frost, nor any accidental or local cause exists to account for it." The specimens here alluded to consisted of lilacs and common laurels. Their young leaves and shoots were dying back, after becoming spotted, much in the manner of the potatoes, and here and there the lowest part of the shoots next the old wood was black and brittle, exactly as in the potato haulm next the old tuber. No fungi were visible externally. The old wood of the lilacs next the dying shoots was brown and decayed, and the evil looked as if it would spread backwards or

downwards. These are, no doubt, unusual symptoms, and in the lilac not such as would be referred to the action of frost in usual years. We suspect, however, that the appearances were really so produced, and that the anomalous symptoms are caused by the very insufficient manner in which the wood of most plants was ripened last autumn. In many places the common laurel was half bleached, instead of acquiring its rich green color, and wherever the yellow shoots have pushed, there seems a great tendency to perish under the least impediment to free growth, such as would be caused by unobserved frost in the early morning, or even by a dry wind. We have not, however, succeeded in finding lilacs or yews in the state described by our correspondent, and conclude that, so far as they are concerned, the affection is local. Roses are much injured. In all such instances the dying shoots should be removed along with three or four inches of sound wood below the disease.

Another correspondent, near Clonmel, finds his peach trees shrivelling up and going off, on trees planted with all possible care in November, 1844. We entertain little doubt that the cause is the same in this case. The season of growth in Ireland last year rendered it impossible for plants like the peach to ripen their wood perfectly in such a climate. The yellowness of the laurels, the want of blossom-buds on the Indian Rhododendrons near Dublin, were unequivocal symptoms of the badness of the season. In this case the diseased appearance will, probably, disappear as the warm season advances; and if we have plenty of sunshine now, healthy leaves may be looked for hereafter, unless the wood should be so unripe as to become gummy and cankered.

To the same cause (that of badly-ripened wood of last year) seems referable a disease that has appeared among coniferous plants. Mr. Ayres, of brooklands, says that, at Blackheath, the whole of the foliage is falling off the spruces and larches; and though a few new branches are breaking out, their numbers are so few, that the trees must be removed. "At this place (Brooklands) a number of the most healthy young trees will in a few days be complete skeletons, and I noticed the same thing happening to large trees of twenty or thirty years' growth on the estate of Colonel Long, at Broomley-hill, in this county. Mr. Wilson, the land-steward of W. Pigott, Esq., of Dullinghamhouse, Newmarket, informed me the disease has seized the spruces in that neighborhood." A similar complaint comes from a writer near Wrexham, with whom larches, from four to twelve years old, are dying off this season. He has some hundreds affected. The disease seems to prevail mostly among trees of the age above mentioned. In a plantation, about thirty years old, not one appears to be affected. The leaders and most of the upper branches are quite bear of leaves; and the lower ones seem scorched, and only just alive. These trees have *hitherto grown very rapidly.* He has three or four silver firs dying in the same manner; but he does not see any other species of tree so attacked.

We do not recognize in these symptoms anything incompatible with a watery condition of last year's wood; arising, not so much from excess of water in the autumn, as from want of sunlight and heat to carry it out of the system. Under such circumstances it may be easily conceived that the resinous secretions necessary to the health of coniferous trees were inadequately deposited, and that now, when growth recommences, the young leaves cannot find in their neighborhood their food (or organizable matter) in such a state that they can assimilate it. The result of that must necessarily be that the foliage will drop off, and the probability is that in such cases the wood will die back, or prove permanently diseased.

We have offered these remarks because, while we feel it our duty to point out dangers that really exist, we have no desire to see persons needlessly, alarmed, as we believe those to be who dread, in such symptoms as have been described, the advent of disasters of which the potato murrain is but the forerunner. We cannot say that we perceive at present any ground for uneasiness. We doubt indeed whether the cases which have been brought under our notice would have excited attention if it had not been for the alarm that exists respecting the mysterious destruction that has overtaken the potato.

While, however, we thus desire to guard our readers against undue apprehensions of evils not likely to arise, we must not conceal the fact that a disease apparently identical with that of the potato has broken out among the yams in Jamaica. We know not to what extent this has gone, but we have in our possession specimens for which we are indebted to Mr. Beckford, of Upper Portland, which place the fact beyond a doubt. It is important, moreover, to remark that the disease has assumed that virulent, putrid form which existed so largely in Ireland. We cannot then but dread lest the food of the West India Islands may be destroyed like our own, and lest the sufferings which have been experienced by the poor people at home should be about to be transferred (?) to our colonies. Such a calamity would be the more severely felt there in consequence of the advance of the potato disease, which is evidently increasing in other countries whatever the event may prove with us, for in Lisbon, which last year was almost uninfected, the young potatoes are *already* attacked to the extent of one-sixth, as is proved by the samples now on sale in London."—*Gard. Chron.*

STRUCTURAL BOTANY

Applied to Horticulture.....Stamens and Pistils.

The stamens and pistils are known to be modifications of leaves, because they very frequently are transformed into petals which are demonstrably such; and because they occasionally revert to the state of leaves. In the double poppy the stamens change into petals, in the double anemone and ranunculus the pistils undergo the same transformation.

The stamens bear at their summits an organ, called the *anther*, which contains a powder called *pollen*.

When the anther is full grown it opens and ejects the pollen, either dispersing it in the air in consequence of the elasticity with which it opens; or depositing it upon the summit of the pistil called stigma; or exposing it to the action of wind, or such other disturbing causes as may liberate it from its case.

The pollen consists of exceedingly minute hollow balls, or cases, containing myriads of particles called granules, which are the fertilizing principle of the stamens.

The pistil has at its base one or more cavities or *cells* called in a ripe state seed vessels, in which bodies called *ovula* are placed; and at its summit one or more secreting surfaces called *stigmata*.

The ovula are the rudiments of seeds.

If the fertilising powder of the pollen come in contact with the stigma, the ovula in the cells of the pistil are vivified, and become seeds.

Late microscopic discoveries render it almost certain that the granules of pollen are the true seeds deposited in the ovula by means of tubes or elongations of the skin of the hollow balls of pollen — there partly developed and secured by various coverings called integuments, until the proper period and circumstances arise for their farther growth in the earth — and that the present idea of vivification by pollen and the sexes of plants is either not correct or not properly understood.

In wild plants a stigma is usually acted upon only by the pollen of the stamens which belong to it.

In this case the seeds thus vivified will, when sown, produce new individuals, differing very little from that by which they were themselves produced.

And, therefore, wild plants are for the most part multiplied from generation to generation without change.

But it is possible to cause deviations from this law, by artificial means.

If the pollen of one species is placed upon the stigma of another species, the ovula will be vivified; and what is called a *hybrid* plant will be produced by those ovula when they shall have grown to be seeds.

Hybrid plants are different from both their parents, and are generally intermediate in character between them.

Reasoning from analogy it was formerly tho't that hybrids were sterile and could not perfect seeds, experience however teaches that this is not the case; but in woody and other plants where hybridation has produced fine varieties either of fruit or flowers, these varieties are usually propagated by buds, cuttings, and scions.

The power of hybridation will probably when experience shall have matured and science arranged more numerous results, become the most correct test of botanical divisions into genera. Great care is requisite in making experiments on hybridation to cut out the anthers of one of the plants experimented on previous to their bursting, to apply the pollen of the other when in perfection, and to place the plant where none others of the genus are in the vicinity.

The tropical warmth of the sun in this country, is very favorable for maturing the pollen of all plants, particularly those from tropical regions, thus facilitating such experiments.

It usually happens that the hybrid has the constitution and general aspect of the polliniferous parent; but is influenced in secondary characters by the peculiarity of the female parent. See more on this subject under article *fruit*.

This should always be borne in mind in procuring new hybrid plants.

Really hybrid plants must not be confounded with such as are spurious, in consequence of their origin being between two varieties of the same species, and not two species of the same genus.

Hybrid plants, are often more abundant flowerers than either parent.

This is, probably, connected with constitutional debility.

Fruit.

Fruit, strictly speaking, is the pistil arrived at maturity.

When the calyx adheres to the pistil and grows with it to maturity, the fruit is called *inferior*; as the apple.

But when the pistil alone ripens, there being no adhesion to it on the part of the calyx, the fruit is called *superior;* as the peach.

The fruit is, therefore, in common language, the flower, or some part of it, arrived at its most complete state of existence; and, consequently, is itself a portion of a stunted branch.

The nature of its connection with the stem is therefore the same as that of the branches with each other, or of leaves with their stem.

A superior fruit consisting only of one, or of a small number of transformed leaves, it has little or no power of forming a communication with the earth and of feeding itself, as real branches have.

It has also very little adhesion to its branch; so that but slight causes are sufficient to detach it from the plant, especially at an early age, when all its parts are tender.

Hence the difficulty of causing peaches, and the like, to *stone*, or to pass over that age in which the vascular bundles that join them to the branch become woody, and secure them to their place.

For the same reason they are fed almost entirely by other parts, upon secreted matter which they attract to themselves, elaborate, and store up in the cavities of their tissue.

The office of feeding such fruit is performed by young branches, which transmit nutriment to it through the bark.

But as young branches can only transmit nutriment downwards, it follows that unless a fruit is formed on a part of a branch below a leaf-bud, it must perish, unless there is some active vegetation in the stem above the branch on which it grows; when it may possibly live and feed upon secretions attracted by it from the main stem; thus in pruning the peach and other trees with *superior* fruit in the spring it is always necessary to leave one or two leaf-buds above the flower-bud.

But inferior fruit, consisting always of the calyx in addition to the pistil, has a much more powerful communication with the branch; each division of its calyx having *at least* one bundle of vascular and fibrous tissue, passing from it into the branch, and acting as a stay upon the centre to prevent its breaking off.

Such fruit may be supposed much more capable of establishing a means of attracting secretions from a distance; and, consequently, is less liable to perish from want of a supply of food.

It is therefore not so important that an inferior fruit should be furnished with growing branches above it, instance, apple, pear.

Fruit is exclusively fed by the secretions prepared for it by other parts; it is therefore affected by nearly the same circumstances as flowers.

It will be large in proportion to the quantity of food the stem can supply to it: and small in proportion to the inability of the stem to nourish it.

For this reason, when trees are weak they should be allowed to bear very little, if any fruit; because a crop of fruit can only tend to increase their debility.

And in all cases each fruit should be so far separated from all others as not to be robbed of its food by those in its vicinity.

We find that nature has herself in some measure provided against injury to plants by excessive fecundity, in giving them the power of throwing off flowers, the fruit of which cannot be supported.

The flavor of fruit depends upon the existence of certain secretions, especially of acid and sugar; flavor will, consequently, be regulated by the circumstances under which fruit is ripened.

The ripening of fruit is the conversion of acid and other substances into sugar.

As the latter substance cannot be obtained at all in the dark, is less obundant in fruit ripened in diffused light, and most abundant in fruit exposed to the direct rays of the sun, the conversion of matter into sugar occurs under the same circumstances as the decomposition of carbonic acid.

Therefore, if fruit be produced in situations much exposed to the sun, its sweetness will be augmented.

And in proportion as it is deprived of the sun's direct rays that quality will diminish.

Fruit produced under circumstances of great moisture and diminution of solar light, as in seasons of continued rain where the sky is much clouded, will be larger, but the flavor will be less sweet and agreeable—this is often the case with the large strawberries.

So that a fruit which when exposed to the sun is sweet, when grown where no direct light will reach it will be acid; as pears, cherries, &c.

Hence acidity may be corrected by exposure to light; and excessive sweetness, or insipidity, by removal from light.

Judicious pruning, therefore, so as to admit all the possible light and air to the fruit, is advantageous, but care must be taken that it be not pursued to the injury of the plant.

It is the property of succulent fruits which are acid when wild to acquire sweetness when cultivated, losing a part of their acid.

This probably arises from the augmentation of the cellular tissue, which possibly has a greater power than woody or vascular tissue of assisting in the formation of sugar.

As a certain quantity of acid is essential to render fruit agreeable to the palate, and as it is the property of cultivated fruits to add to their saccharine matter, but not to form more acid than when wild, it follows that, in selecting wild fruits for domestication, those which are acid should be preferred, and those which are sweet or insipid rejected.

Unless recourse is had to hybridism; when a wild insipid fruit may be possibly improved, or may be the means of improving something else.

It is very much upon such considerations as the foregoing that the rules of training must depend.

The effect of removing a ring of bark from the fruit-bearing branch, is to increase considerably the size of the fruit above the ring, by retaining the juices of the wood which are prevented from returning, the communication being cut off. But if the ring is too wide or the branch on which it is practiced too small, a morbid state of early maturity is produced, and the fruit is worthless. The breadth of the ring should be in proportion to the thickness of the branch, and in fruit-bearing trees should be performed as soon as the flowers are apparent in the spring.

Hybridation has been had recourse to with much success to improve fruits, but although the results have been thus good, sufficient care has not been taken to note down the detail of the experiments so as to arrive at any fixed laws capable of affording unerring rules of action.

Mr. Knight says he had observed generally a strong prevalence of the constitution and habits of the plant whose pistil was fertilized by the pollen of another. Mr. Herbert, in discussing a hybrid Cytisus, thinks that the plant with the pistil influences the leaf, and that with the pollen the flower. This gentleman in his work on Amaryllidaceæ, has given a most interesting and detailed account of many years experience on hybridation.

The experience of Van Mons in raising new varieties of fruit trees from seed, has been eminently valuable and successful, and no doubt would throw light on this subject.

Teschemacher's Elm. Hort.

BUDDING.

Budding (*inoculating*, of the old authors) differs from common grafting not the least in its nature or effects. Every bud is a distinct individual, capable of becoming a tree under favorable circumstances. In grafting, we use a branch, composed of several buds with a considerable quantity of bark and wood; while in budding, we employ but a single bud, with a very small quantity of the adjoining bark and wood.

The advantages of budding fruit trees, compared with grafting, are so considerable, that in this country it is ten times as much practised. These are, first, the great rapidity with which it is performed; a skilful budder, with a clever boy following him to *tie* the buds, being able to work from a thousand to twelve hundred young nursery stocks in a day. 2d. The more convenient season at which it is performed, in all countries where a short spring crowds garden labors within a small space. 3d. Being able to perform the operation without injuring the stock in case of failure, which is always more or less the case in stocks headed down for grafting. 4th. The opportunity which it affords, when performed in good season, of repeating the trial on the same stock. To these we may add that budding is universally preferred here for all stone fruits, such as Peaches, Apricots, and the like, as these require extra skill in grafting, but are budded with great ease.

The proper season for budding fruit trees in this country is from the first of July to the middle of September; the different trees coming into season as follows: Plums, Cherries, Apricots on Plums, Apricots, Pears, Apples, Quinces, Nectarines and Peaches. Trees of considerable size will require

budding earlier than young seedling stocks. But the operation is always, and only, performed *when the bark and stock separates freely from the wood*, and when the buds of the current year's growth are somewhat plump, and the young wood is growing firm. Young stocks in the nursery, if thrifty, are usually planted out in rows in the spring, and budded the same summer or autumn.

Before commencing you should provide yourself with a budding knife, (about four and a half inches long,) having a rounded blade at one end, and an ivory handle terminating in a thin rounded edge called the *haft*, at the other.

In choosing your buds, select thrifty shoots that have nearly done growing, and prepare what is called a *stick of buds*, by cutting off a few of the imperfect buds at the lower, and such as may be yet too soft at the upper ends, leaving only smooth well developed single buds; double buds being fruit-buds. Cut off the leaves, allowing about half an inch of the *foot-stalks* to remain for conveniently inserting the buds. Some strands of bass-matting about twelve or fourteen inches long, previously soaked in water to render them soft and pliable, (or in the absence of these some soft woollen yarn,) must also be at hand for tying the buds.

Shield or T budding is the most approved mode in all countries. A new variety of this method now generally practised in this country we shall describe first as being the simplest and best mode for fruit trees.

American shield budding. Having your stick of buds ready, choose a smooth portion of the stock. When the latter is small, let it be near the ground, and, if equally convenient, select also the north side of the stock, as less exposed to the sun. Make an upright incision in the bark from an inch to an inch and a half long, and at the top of this make a cross cut, so that the whole shall form a T. From the stick of buds, your knife being very sharp, cut a thin, smooth slice of wood and bark containing a bud. With the ivory haft of your budding knife, now raise the bark on each side of the incision just wide enough to admit easily the prepared bud. Taking hold of the foot-stalk of the leaf, insert the bud under the bark, pushing it gently down to the bottom of the incision. If the upper portion of the bud projects above the horizontal part of the T, cut it smoothly off now, so that it may completely fit. A bandage of the soft matting is now tied pretty firmly over the whole wound, commencing at the bottom, and leaving the bud, and the foot-stalk of the leaf only exposed to the light and air.

Common shield-budding, practised in all gardens in Europe, differs from the foregoing only in one respect—the removal of the slice of wood contained in the bud. This is taken out with the point of the knife, holding the bud or shield by the leaf stalk, with one hand, inserting the knife under the wood at the lower extremity, and then raising and drawing out the wood by bending it upwards and downwards, with a slight jerk, until it is loosened from the bark; always taking care that a small portion of the wood remains behind to fill up the hollow at the base or heart of the bud. The bud thus prepared is inserted precisely as before described.

The American variety of shield budding is found greatly preferable to the European mode, at least for this climate. Many sorts of fruit trees, especially Plums and Cherries, nearly mature their growth, and require to be budded in the hottest part of the summer. In the old method, the bud having only a shield of bark with but a particle of wood in the heart of the bud, is much more liable to be destroyed by heat, or dryness, than when the slice of wood is left behind in the American way. Taking out this wood is always an operation requiring some dexterity and practice, as few buds grow when their eye, or heart wood is damaged. The American method, therefore, requires less skill, can be done earlier in the season with younger wood, is performed in much less time, and is uniformly more successful. It has been very fairly tested upon hundreds of thousand fruit trees, in our gardens, for the last twenty years, and, although practised English budders coming here, at first greatly prejudiced against it, as being in direct opposition to one of the most essential features in the old mode, yet a fair trial has never failed to convince them of the superiority of the new.

After treatment. In two weeks after the operation you will be able to see whether the bud has taken, by its plumpness and freshness. If it has failed, you may, if the bark still parts readily, make another trial; a clever budder will not lose more than 6 or 8 per cent. If it has succeeded, after a fortnight more has elapsed, the bandage must be loosened, or if the stock has swelled much, it should be removed altogether. When budding has been performed very late, we have occasionally found it an advantage to leave the bandage on during the winter.

As soon as the buds commence swelling in the ensuing spring, head down the stock, with a sloping back cut, within two or three inches of the bud. The bud will then start vigorously, and all "robbers," as the shoots of the stock near to and below the bud are termed, must be taken off from time to time. To secure the upright growth of the bud, and to prevent its being broken by the winds, it is tied when a few inches long to that portion of the stock left for the purpose. About mid-summer, if the shoot is strong, this support may be removed, and the superfluous portion of the stock smoothly cut away in the dotted line, when it will be rapidly covered with young bark.

We have found a great advantage, when budding trees which do not take readily, in adopting Mr. Knight's excellent mode of tying with two distinct bandages; one covering that part below the bud, and the other the portion above it. In this case the lower bandage is removed as soon as the bud has taken, and the upper left for two or three weeks longer. This, by arresting the upward sap, completes the union of the upper portion of the bud, (which in plums frequently dies, while the lower part is united,) and secures success.

Reversed shield budding, which is nothing more than making the cross cut at the bottom, instead of the top of the upright incision in the bark, and inserting the bud from below, is a good deal practised in the south of Europe, but we have not found that it possesses any superior merit for fruit trees.

An ingenious application of budding, worthy

the attention of amateur cultivators, consists in using a blossom-bud instead of a wood-bud; when, if the operation is carefully done, blossoms and fruit will be produced at once. This is most successful with the Pear, though we have often succeeded also with the Peach. Blossom-buds are readily distinguished, as soon as well formed, by their roundness, and in some trees by their growing in pairs; while wood-buds grow singly, and are more or less pointed. We have seen a curious fruit grower borrow in this way, in September, from a neighbor ten miles distant, a single blossom-bud of a rare new pear, and produce from it a fair and beautiful fruit the next summer. The bud, in such cases, should be inserted on a favorable limb of a bearing tree.

Annular budding, we have found a valuable mode for trees with hard wood, and thick bark, or those which, like the walnut, have buds so large as to render it difficult to bud them in the common way. A ring of bark, when the sap is flowing freely, is taken from the stock, and a ring of corresponding size containing a bud, from the scion. If the latter should be too large, a piece must be taken from it to make it fit; or should all the scions be too small, the ring upon the stock may extend only three-fourths the way round, to suit the ring of the bud.

An application of this mode of great value occasionally occurs in this country. In snowy winters, fruit trees in orchards are sometimes girdled at the ground by field mice, and a growth of twenty years is thus destroyed in a single day, should the girdle extend quite round the tree. To save such a tree, it is only necessary, as soon as the sap rises vigorously in the spring, to apply a new ring of bark in the annular mode taken from a branch of proper size; tying it firmly, covering it with grafting clay to exclude the air, and finally drawing up the earth so as to cover the wound completely. When the tree is too large to apply an entire ring, separate pieces, carefully fitted, will answer; and it is well to reduce the top somewhat by pruning, that it may not make too large a demand on the root for a supply of food.

Budding may be done in the spring as well as at the latter end of summer, and is frequently so performed upon roses, and other ornamental shrubs, by French gardeners, but is only in occasional use upon fruit trees.—*Downing*.

From the N. Y. Jour. of Com.

PREPARATION OF WOOL.

New York, May 16, 1846.

Messrs. Hale & Hallock:

Dear Sirs:—I have your favor of this day's date. Such information as I can give on the subject of your inquiry, is at your service, for the benefit of those interested.

More than one-half of all the American fleece wool exported from the United States of the last year's clip was owned and shipped by myself and by others having a joint interest with me. The purchases were all made at the lowest point of the season, beginning on the first day of October last. The result has been a net loss of $5993, and 188 bales of wool yet unsold—equal only to the fraction of a penny stirling on each pound. Not a fleece of the wool was sold to meet the payment of drafts drawn against it, nor was any portion of it unduly pressed upon the market; and this loss arose from causes unnecessary, easily avoided, and entirely within the control of parties in this country.

The prices of United States fleece-wool are affected very injuriously in foreign markets by its unclean condition. It contains too much oil, and yolk, and dirt. The sheep are generally washed with too little care, and run too long after washing before shearing. A large portion of the wool from this cause must pass through the hands of those who sort it and scour it in soap and water, before it is sold to the manufacturers.

The wool itself is of superior staple, and while upon the sheep is inferior to no other in the world, of equal grade; and it may be safely stated, that every pound of oil, or other worthless substance, will in the English markets, deduct from the value of the wool containing it, the price, at least of two pounds of wool. English manufacturers and staplers before purchasing, open a portion of the fleeces, and examine carefully, not only the fineness, but also the *strength* of the staple, and its condition throughout.

The first important operation in preparing our fleece-wool for export, is to properly cleanse it before shearing. The sheep should be washed in clear running water—the water must run freely through every part of the fleece, and the wool and every part of it should be pressed and worked with the hands while under water, until the dirt and oil are removed, and the *water runs off clear*. The shearing should then take place as soon as the sheep become dry after washing.

Then comes the tying up of the fleeces.

All the loose locks, clippings and tags, and everything unclean, or of an inferior quality, and the coarse wool from the thighs, if there be any, should be wholly rejected, and the fleeces tied up firmly so as to keep their shape, and show, as is customary, the best part of the fleece on the outside.

This terminates the wool-grower's part—but I will here remark, that sheep should be kept as nearly as possible in uniformly good health and flesh, because every portion of the staple or fibre of the wool which grows while the sheep is very poor from disease or want of food, has so little strength as to break in working; and if this weak growth takes place in the fall of the year, it destroys the fleece for many purposes.

The next step is to properly sort and sack the fleeces and direct them to the best market. This is the merchant's part, and more than a shipper's profit depends upon its being performed understandingly.

In England each manufacturer devotes his attention to one particular description of goods, for which his machinery has been constructed, and he makes no other. The makers of each kind of goods have established themselves mostly together in some one part of the kingdom, where they have a wool market of their own, in which they seek for the qualities and descriptions suitable for their purpose, and will buy no other. The broadcloth makers in the west of England: the worsted combers of Yorkshire: the flannel manufacturers of Rosbdale; and those who make hosiery in Nottingham, purchase in their several markets

a supply suitable only for their own machinery. So nice does this discrimination run, that the fleeces of fine wool, taken from the sheep one year old which were never before shorn, are mostly sent to one part of the country and there sold for one purpose, and the fleeces taken from the same sheep the next year, are sent to another part of the country, and there wrought into a very different kind of goods. Thus it is of very great importance that *fleece*-wool for shipment, before it goes on board, should be sorted and sacked according to the grades of foreign manufactures and suitable for their purposes, in order that it may be sold *directly* to them; otherwise, even if clean and in good order, it must pass first through other hands, that re-sort it, re-sack it, and distribute it to various parts of the kingdom at considerable expense.

The size of the bales is the next thing to be kept in view. I have paid on large shipments as high as one dollar *per bale* for "dock dues," without reference to the size of the bales; while at some ports the charge is less than one-tenth part of this sum.

Customs in England give the purchaser an allowance on *each bale* called "the draft;" but the amount thus given varies in different markets. I have many accounts of sales in which only one pound weight *per bale* is deducted for "the draft." I have other accounts of sales made in different places, in which two pounds, and three pounds, and four pounds, and even eight pounds *per bale* is deducted for "the draft" without reference to the size of the bale. This may seem unreasonable, but is established by the ancient usage of the different markets, and must be complied with. The bales should therefore be of a size suited to their destination; but not too large, else they will not be lifted, but rolled over the docks and streets. Each sack should be firmly packed by a man inside, but never pressed by machinery, and every fleece of weak staple carefully rejected, and those fleeces packed by themselves.

The shipment then requires some attention.

The wool should be placed on board dry; with the sacking whole and clean, and should always be sent as light freight in the upper part of the vessel. Our wool contains too much oil and gummy matter to be placed low in the ship, with heavy weights pressing upon it, without being in some degree injured by matting together.

This closes the part of the American merchant.

In illustration, I will remark that I have had two invoices of wool sold in England at the same price, and within three days of each other, whose value in this country differed ten cents per pound on the day of their purchase, or any other day since. The one kind answered the market, the other did not, but was greatly superior in fineness of fibre.

My own clip of wool, grown upon my own lands, and cut last June, and which I know all about, shipped to England in one vessel, and consigned it, in two equal quantities, of equal qualities, to two different markets, about 200 miles distant from each other, and they were sold near the same time, by direction of the same house, and after full and fair exposure in both markets, at a difference of more than seven cents per pound in price. Its quality and condition were very superior, and just suited to the one market, and not to the other.

Within the past year, I have sent more or less wool to every part of England, and to Wales, and to Scotland, comprising the various qualities grown in Illinois, Michigan, Ohio, Pennsylvania, New York and Vermont. Nearly every invoice was accompanied with an intimation that it was not sent so much with a view to profit as to try their market, and hoping to receive in return suitable directions or suggestions for a better method for preparing and shipping such wools to England. The result has beeu a voluminous correspondence, giving ample details, and all the particulars required. It is from this correspondence and the results of those actual sales, as well as from personal observation and information, that I venture the opinions already expressed. I trust that past errors may be avoided in the future—and I now have done with the preparation and shipment.

I remain yours truly,

HAMILTON GAY,

REMARKABLY PRODUCTIVE COWS.

"The most extraordinary cow of which we have any record, is one which was owned by William Cramp, of Lewes, Sussex, England, concerning which the Board of Agriculture collected the following facts: She was of the Sussex breed, and was calved in 1799. From May 1, 1805, to April 2, 1806, forty-eight weeks and one day, her milk produced 540 pounds of butter. The next year, or from April 19, the day she calved, to February 27, 1807, forty-five weeks, she produced 450 pounds of butter. It is stated she was sick this year, and under the care of a farrier three weeks after calving. The third year, from April 6, 1807, the time she calved, to April 4, 1808, fifty-one weeks and four days, she produced 675 pounds of butter. The fourth year, from April 22, 1808, the time she calved, to Feb. 13, 1809, forty-two weeks and three days, she produced 466 pounds of butter. The fifth year, from April 3, 1809, to May 8, 1810, fifty-seven weeks, she produced 594 pounds butter. The greatest quantity of butter mentioned as having been produced by this cow in any one week, was eighteen pounds, and the greatest quantity of milk mentioned as having been given in any one day, was twenty quarts. She was well fed at all times. In summer she was fed on clover, lucerne, rye-grass and carrots; three or four times a day, and at noon about four gallons of grains and two of bran, mixed together. In winter she was fed with hay, grains, and bran, mixed as before stated, feeding often."

The next most remarkable in the catalogue is the celebrated Oaks or "Danvers prize cow." The first notice we find of her is in a communication from E. Hersey Derby, Esq. to the Massachusetts Agricultural Repository and Journal, dated Dec. 25, 1816. From this it appears that in 1813, Caleb Oaks of Danvers, Mass., bought this cow of his brother-in-law, by whom she had been purchased out of a drove. She was then five years old. Mr. Oaks made from her the first year 180 pounds butter. The next year, 1814, she produced 300 pounds; in 1815, over 400 pounds; in 1816, 484 pounds. in the latter year she took the

first premium at the Massachusetts show at Brighton. The greatest quantity of butter made from her in one week was 19¼ pounds; the greatest quantity of milk given per day was from sixteen to eighteen quarts. She was fed, in addition to ordinary pasture feed, with one bushel of Indian meal per week, and allowed to drink all her skimmed milk. After the above trials, she was purchased by the Hon. Josiah Quincy; her yield in butter, however, never came up to what it had before been, though she sometimes made upwards of sixteen pounds per week, and her milk was of such richness that five quarts of it frequently yielded a pound of butter.

Mr. Colman states that he found in Ireland a dairy of fine cows of the Kerry breed (a small race) which averaged 320 pounds of butter to each for the season.

The milk given by one of Col. Jaques's "cream-pot" cows in three days, afforded nine pounds of butter, or at the rate of twenty-one pounds per week; and another of the same family made nineteen pounds per week.

Six Durham cows belonging to George Vail, of Troy, made in thirty days (June, 1844) 262 pounds seven ounces butter—being an average of forty-three pounds twelve ounces to each cow. The average quantity of milk per day for each cow was twenty-two and a half quarts. The feed was grass only.

Mr. Colman, in his Fourth Report on the Agriculture of Massachusetts, gives a list of sixty-six "native" cows and their produce, from which we take the following:

The Norse cow, owned in North Salem, made twenty pounds of butter in one week, and averaged fourteen pounds per week for four successive months.

A cow owned by S. D. Colt, of Pittsfield, from December 1 to April 26, 148 days, produced 193 pounds of butter.

Four cows belonging to Jesse Putnam, Danvers, Mass., in 1830, averaged more than 208 pounds butter each for the season. Highly fed.

A cow owned by S. Henshaw, Springfield, produced seventeen and three-quarter pounds butter per week, and in one case twenty-one pounds of excellent butter. In four and a half days, that is four days and one milking, she produced fourteen pounds three ounces of butter—at the rate of twenty-two and a half pounds per week.

"Katskill" received the first prize of the New York State Agricultural Society as the best dairy cow exhibited, in Poughkeepsie, in 1844. We are unable to refer to the original statement furnished the society by Mr. Donaldson in regard to the produce of this cow, but can say that satisfactory evidence was given that she had yielded, when kept on grass only, thirty-eight and a half quarts of milk per day, and that from the milk given by her in two days, six and a half pounds of butter were made, being at the rate of twenty-two and three-fourth pounds per week. Her appearance fully corresponds with the account of her produce. It is proper to state that while her milk was measured for the purpose of accurately ascertaining the quantity, she was milked four times every twenty-four hours."—*Cultivator*

WHEAT IN NEW YORK.

Wheat, according to present appearances, will be about an average crop. It would have been unusually large, had not the Hessian fly been more abundant and destructive than common.—The writer has counted thirty-eight of the young of this insect in a single stem of wheat, and many that contained from ten to twenty *larvæ*. Taking Western New York together, the loss from the fly alone will doubtless be at least 500,000 bushels. In the "Farmer's Dictionary" (a work recently published by the Harpers,) it is recommended "to seed early" as a preventive against injury from the wheat fly. This certainly is bad advice, so far as this latitude is concerned. All wheat growers in Wheatland concur in saying that early sown wheat has suffered much more from the attacks of the fly than late sown. Mr. Wm. Garbutt, who has plowed up some fourteen acres of wheat and sown the field with oats, in consequence of having the wheat destroyed by the Hessian fly, assures us that his loss is mainly owing to *early sowing*, at or near the first of September.

Of the fifty varieties of winter wheat sown by Gen. Harmon, no one has escaped the ravages so well as his improved white flint. Mr. Ellsworth, late Commissioner of Patents, in a letter published in the recent report of his successor, makes the following statement in regard to the reluctance with which insects feed on this variety of wheat: "A remarkable circumstance occurred in my wheat field, where several varieties were sown. The red-chaff, bald wheat was attacked by the army-worm, and the stalks completely stripped. When the worms reached the white flint wheat, obtained by Gen. Harmon, of Wheatland, N. Y., *they stopped and went around the piece without touching a single stalk!*"

Mr. Ellsworth cultivates a large farm near Lafayette, Indiana.

The fly does not wholly refuse to deposit its eggs on the stems of the most *flint* like wheat, nor do its larvæ omit to draw their nourishment from this plant. All that can be said is, that it is less affected than any other variety of which we have any knowledge.

Our early southern wheat, particularly a variety known as "Alabama Wheat," has been greatly injured by mildew. By the aid of a good microscope, the writer of this, and the pupils attending the Western New York Agricultural School, have been able to see the *spores*, or seeds of this parasite, growing on the leaves of wheat.

The "*Touland* Wheat," brought from England last season by Mr. Fuller, of Cayuga, (some of which he gave Gen. Harmon,) has been nearly destroyed by the fly.

A beautiful specimen of wheat sent from the province of Leon, in Spain, to Isaiah Townsend, Esq., of Albany, by our Consul at Bilboa, and by him given to Gen. H., has stood the winter well. It is but slightly affected by insects. Its straw is small, leaves of a medium size, and slightly attacked by mildew.

We have three varieties of Virginia wheat which have stood the winter well, are early, and promise good returns. They are the "Orange," "Blue Stem," and "Virginia Red Bald." The fly has worked but little among these plants.

Samples received from Leghorn, Germany, and

Tuscany, have proved nearly a total failure. A specimen from Botany Bay is hardy, has tillered well, and promises a good crop.

To prevent *mildew* and *rust*, land should be well drained, free from weeds and grass, and not contain an excess of vegetable matter. Charcoal, ashes, salt, and lime, are of great service in forming firm straw, and thus refusing a nidus for the growth of parasites. There is considerable danger of loss from rust, owing to the luxuriance of the stems and leaves of wheat plants, their large size, loose and spongy texture. Of course much will depend on the weather for the next two or three weeks. If this shall be hot, damp, and cloudy, immense injury will be done. To avoid the Hessian fly our best wheat-growers regard it as quite early enough to begin their seeding at or after the 16th of September.—*Gen. Farm.*

WHEAT AND CLOVER AMONG CORN.

In our last volume, we mentioned that a farmer of this county had tried with entire success, the experiment of sowing clover seed in a corn-field. He sowed the seed immediately before going through his corn for the last time, and then followed with the cultivator. The clover grew finely, so that by the time the corn was harvested, it covered the ground and was up ankle high.

The same experiment, we learn, was made last year with wheat by Mr. Harrison, of Lenawee county, the inventer of the cultivator mentioned by a correspondent in this number. A field of sixty acres of thrifty corn was sown with wheat, which was *cultivated* in. Late in the fall, the corn was taken off, the wheat covering the ground at the time handsomely. We understand that the crop of wheat is very promising, compariug favorably with others which have a regular summer fallowing, and that no one could infer from the appearance of the field, the manner in which it was got in. An observing farmer informs us that he has remarked that wheat sown after corn, and got in seasonably, turns out better crops, especially on rich lands, than after a naked fallow. There is a diminished growth of straw, but this is brighter, the head better filled, the kernel plumper. We think we see a reason for this, in the exhaustion of some vegetable matter by the corn crop, and in the very different constituents of the corn and wheat kernel, which would make the latter a very proper crop to succeed the former. The objection to this course has usually been, that by the time the corn is harvested, and the ground prepared for the wheat, the season is too far advanced. Hence, this course cannot well be pursued on an extensive scale.

But the plan of sowing wheat among corn, obviates this objection. The only additional ones that appear to present themselves are, the difficulty of sowing the seed, (which must be done in every interval between the rows separately,) and the damage to the wheat incurred during the harvesting and drawing off of the corn crop. The latter would probably not be serious. The difficulty of sowing the seed might be diminished by having the rows of corn north and south, a wide distance apart, say 5 feet, while in the other direction, they shall only be far enough to admit the passage of the cultivator between them.

When we consider the great saving of labor which such a system of management produces, and the profitable crop obtained as a substitution for the naked fallow, it must be admitted there are great advantages. It may be thought that there will be too great an exhaustion of the land; but it is to be remembered as one of the maxims of improved husbandry, that with a proper rotation of crops, and a proper husbandry and application of manures, *no field ever need lie fallow in order to preserve or restore its fertility.* It seems well ascertained that there is injury as well as benefit in the exposure of a bare soil to the sun, wind and rains of summer, and that it is thus exhausted of some valuable properties while it acquires others. We think it not improbable that the benefit of the shade of the corn-field may be nearly a recompense for the ingredients taken up by the crop.

As to stocking down a corn-field with clover, this plant will vegetate just as much more thriftily than it would among oats, wheat or barley, as a weed does. A thrifty growth of oats, wheat, &c., it is well known, will effectually choke down weeds—so it will clover; and it is not till these crops are matured and removed that the clover exhibits any considerable vigor of growth. The advantage whether with plant or animal, of having a vigorous unchecked growth from the start, need not be insisted on.

The method above spoken of applies of course, only to the *level* culture of corn.—*Mich. Far.*

ANALYSIS OF CLOVER.

In the last Cultivator are contained the results of a labored analysis of red clover, made by Prof. Horsford, an American who has been for some time a student in Agricultural Chemistry, under the celebrated Liebig.

Of the dry plant altogether, the per cent. of ashes was 11,18 per cent.
Of the leaves, 10,69 do.
Of the stems, 8,52 do.

Ingredients of the ashes.

Potash,	18,101
Sodium,	1,874
Soda,	40,712
Lime,	21,914
Magnesia,	8,289
Phosphate of iron,	670
Chlorine,	2,856
Phosphoric acid,	3,951
Sulphuric acid,	1,063
Silica,	2,605

It will be observed that this differs somewhat from the analysis given in Johnson's Encyclopedia. The discrepancy is widest in the quantity of soda.

According to this analysis, 1000 lbs. of dry clover hay contained of

Potash,	19,95 lbs.
Soda,	5,29 "
Lime,	27,80 "
Magnesia,	3,33 "
Alumina,	14 "
Silica,	3,60 "
Sulphuric acid,	4,47 "
Phosphoric acid,	6,57 "
Chlorine,	3,62 "
Total,	74,78 lbs.

THE CHECK OR BEARING REIN.

I am anxious, in this place, to add my anathema against that inhuman instrument of torture, the bearing-rein. It is no less detrimental to the utility of the animal than it is replete with agony to him. It must have been invented by a savage, and can only be employed by the insensate.—Whence the benefit of unbaring a draught-horse when going up hill? Because the head can then be thrown into its natural position, and materially assist by its weight in drawing the load. If it is beneficial to loose the head at that time, it must also be so on other occasions. Look at the elongated mouths of the unfortunate animals thus so wantonly abused—torn by the bit in their unavailing efforts to overcome this truly barbarous instrument! What produces that dreadful disease, poll-evil, but the action of this cruel strap; constraining the head during the violent exertions of the animal, producing inflammation and ulceration of the point upon which it articulates with the spine? Poll-evil, so generally supposed to originate from blows inflicted on the part, is attributable alone to the gaging-rein. I never saw a horse used entirely for the saddle attacked with this affection. In order to obtain momentary relief from the torment inflicted by the bearing-rein on the poll and mouth, the poor creature is compelled incessantly to toss up his head. By thus strapping down the head you say, practically, "I expect you to draw a certain weight, but I will take away part of your power of doing so." Some have urged that the bearing-rein contributes to the safety of the animal, who, without it, would be more liable to come down. However applicable such an argument may be to those employed in quick draught—though even with them the utility of this instrument is not only exceedingly doubtful, but fast giving way to a more rational method of treatment—it assuredly does not apply to cart-horses, for little fear is ever entertained of their falling; and broken knees, so common among the faster breeds, are rare amongst them.

The Horse in Health and Disease.

WHAT CAUSES DUSTY HAY.

Every farmer has probably observed that sometimes, after hay has been in the barn for a time, on removing it much dust arises from it, and this, too, when it was apparently clean and dry when it was put into the mows. We have never been satisfied in regard to the cause of this.

A writer in the Massachusetts' Plowman on the subject of making barns tight by clap-boarding or shingling them, thinks that it is injurious to make them tight, and says that the hay will become "dusty and smoky," when that kept in more open barns will remain bright and good if it is secured in good order. The Editor of the Plowman endorses the opinion, and observes that he has known numerous instances of spoiled hay in consequence of tight loading.

Can any of our readers throw any light upon the subject? Does hay, when cut in good season, well made and put into stacks, ever become dusty? Some attribute this dust to the hay being late cut, and to its accumulating dust from the atmosphere which adheres to the hay. If this were the case, why does not the dust show itself while getting the hay in, as plentifully as afterwards? If it be true that tight barns are actually injurious to hay, it ought to be generally known, for it would save much expense which many incur with a belief that it is best, when they would not incur the same if it is actually a damage to their fodder.—*Me. Far.*

Mr. Colman gives some account of the experiments in England with steeped seeds. They are conflicting. Some are successful in a high degree; some but partially, and some are total failures. They may be found at page 114 of his "European Agriculture."

Below is the latest experiment of which we have heard; and it will be seen that it was a total failure.

"Many landowners and farmers in the neighborhood of Cassel, in Belgium, and Frankfort-on-the-Maine, according to Mr. Bickes's prospectus, appear to have obtained extraordinary results from seeds prepared by him, even when sown on sandy, bad soils of the worst description in those countries. In order to afford Mr. Bickes an oportunity of submitting his experiments to the test of public inspection, some borders were employed in the Jardin des Plantes, in which the prepared seeds were sown by Mr. Bickes himself, in April, 1845; and adjoining, in the same kind of soil, similar portions of ground were sown with seeds which had undergone no preparation. The seeds were sown in garden soil, and also in an artificial sandy soil. They consisted chiefly of the cereals—maize, wheat, rye, oats; and some clover, lucerne, turnep, beet, flax, hemp, haricot; in short all kinds which, under the procedure, are stated to yield four times the produce derived from sowings made in the usual way. The result of the experiment was, that all the plants came up and grew as in ordinary cases; no difference having been observed between those from prepared seeds and those from seeds not prepared. The haricots, having been sown in the beginning of April, were partly decomposed in the ground, perished by the wet and cold, and consequently no result was obtained from them. The other plants exhibited their ordinary degree of development; they flowered, and ripened their seeds at the usual periods, without realizing any of the advantages announced in Bickes's prospectus.

M. Pepin, in Revue Horticole.

STRAWBERRIES.

Our citizens have cause, daily, to thank Mr. Longworth, for promulgating his discovery in relation to the importance of planting out a due proportion of staminate and pistillate plants of the strawberry, to ensure abundant crops. This secret was formerly confined to a few gardeners, about large cities, who were thus able to monopolize the culture, and keep the price as high as from twenty-five to fifty cents per quart. About Cincinnati, Mr. L's theory is believed in, and univer sally adopted; and the consequence is, all classes daily luxuriate on this delicious fruit at five to ten cents per quart.

A few days since, a friend from Philadelphia

related an anecdote that strikingly confirms the truth of Mr. L's theory. An intelligent gardener in that vicinity, aware of the importance of keeping a due proportion between his staminate and pistillate plants, was in the habit of thinning out the barren staminates, and throwing them over the fence; they were eagerly picked up and planted by his neighbors, who felt sure of equal success with the gardener. After many ineffectual attempts, they all gave up raising strawberries, and left the field clear for the gardener, with his high prices. Their staminates, planted alone, refused to bear; and, to use the forcible expression of the narrator, "they could no more raise a quart of berries than they could sprout a grave stone."

The sales of strawberries in Cincinnati markets now range between eight and twelve thousand quarts per day, as we learn from the indefatigable editor of Cist's Advertiser. On Saturday last, he visited all the markets, and was satisfied that upwards of 19,000 were sold that day. On Thursday, one individual brought in 3000 quarts—another had *two tons*. Most of them are raised on the banks of the Licking, opposite this city, where one of the Culbertsons has fifty acres in one field and fifteen in another, devoted exclusively to the culture of this fruit; a brother of Mr. C. is about as extensively engaged in this culture, and there are many others in the same region on a more moderate scale of operations. Three hundred hands are employed in the Licking strawberry patches. Most of the finer varieties are raised in Delhi, Greene, and other towns on the Ohio side, and are packed with more care, in quart and two-quart boxes, and brought in daily, and left at the houses of regular customers. — *Cin. Gaz., June* 11.

Salt for Horses.—A person who kept sixteen horses made the following experiment with seven of them which had been accustomed to eat salt with their feed. Lumps of rock-salt were laid in their mangers, and these lumps previously weighed were examined regularly, to ascertain what quantity weekly had been consumed, and it was repeatedly found that, whenever these horses were fed on hay and corn, they consumed only two and a half or three ounces per day, and when they were fed with new hay, they took six ounces per day. This fact should convince us of the expediency of permitting our cattle the free use of salt at all times; and it cannot be given in so convenient a form as rock salt, it being much more palatable than the other in a refined state, and by far cheaper.—*Bos. Cult.*

Manures for Fruit Trees.—No tree appears to be more benefitted by animal manures than the peach tree. We may often observe this when it grows near a barn-yard, so as to reach the manure: that the growth is greater, the leaves greener, and the fruit larger, than when it stands on sterile ground; and even as a general rule, fruit of the same variety is flavored in proportion to its size; the larger, the finer. Urine may be very advantageously applied to this tree, especially while it is small, as well as to young apple trees. It not only hastens their growth, but, by its offensive odor, repels the *borer* from the latter, and the peach-worm (Ægeria) from the former. A small tree will bear a pint once a fortnight, and perhaps more and oftener; for I have never injured any of my trees by this application, and consequently have not ascertained the amount which may be used upon them; certainly large trees will bear much more.—*Am. Quar. Journal.*

Export of Bread Stuffs.—It is altogether unexampled that such immense shipments of breadstuffs should have been made from this country during the last six months, and yet the price be so slightly affected at home. We know not how to account for it, except on the confidence which the dealers and growers have in the capacity of the country to increase its supply from the next crops. From New York alone, during the last six months, there have been exported to foreign countries,

Bbls. Flour - - -	460,101
Bush Wheat - - -	380,432
Bush. Corn, - - -	544,614
Bush. Rye, - - -	175,140
Bush. Barley, - - -	99,324
Tierces of Rice, - -	17,263

Besides this, great quantities have been shipped from New Orleans, Baltimore, Richmond, Philadelphia, Alexandria—and even from Boston, 850,000 bbls. Flour have been shipped.

Newburyport Herald.

To prevent Brass Vessels from contracting Verdigris.—After being used, instead of wiping them dry, it has been found that by constantly immersing them in water, they are kept perfectly innoxious, and will remain for years fully as clean and nearly as bright as when they first came out of the hands of the workmen.—*Am. Agricult.*

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